

1 CLAIMS

2
3 What is claimed is:

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6 1. A method of making a cased wellbore comprising at least
7 the steps of:

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9 assembling a lower segment of a drill string comprising
10 in sequence from top to bottom a first hollow segment of
11 drill pipe, a latching subassembly means, and a rotary drill
12 bit having at least one mud passage for passing drilling mud
13 from the interior of the drill string to the outside of the
14 drill string;

15
16 rotary drilling the well into the earth to a
17 predetermined depth with the drill string by attaching
18 successive lengths of hollow drill pipes to said lower
19 segment of the drill string and by circulating mud from the
20 interior of the drill string to the outside of the drill
21 string during rotary drilling so as to produce a wellbore;

22
23 ceasing rotary drilling with the drill string on at
24 least one occasion, introducing into the drill string a
25 logging device having at least one geophysical parameter
26 sensing member, measuring at least one geophysical parameter
27 with said geophysical parameter sensing member, and removing
28 the logging device from said drill string;

29
30 after said predetermined depth is reached, pumping a
31 latching float collar valve means down the interior of the
32 drill string with drilling mud until it seats into place
33 within said latching subassembly means;

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1 pumping a bottom wiper plug means down the interior of
2 the drill string with cement until the bottom wiper plug
3 means seats on the upper portion of the latching float collar
4 valve means so as to clean the mud from the interior of the
5 drill string;

6
7 pumping any required additional amount of cement into
8 the wellbore by forcing it through a portion of the bottom
9 wiper plug means and through at least one mud passage of the
10 drill bit into the wellbore;

11
12 pumping a top wiper plug means down the interior of the
13 drill string with water until the top wiper plug seats on the
14 upper portion of the bottom wiper plug means thereby cleaning
15 the interior of the drill string and forcing additional
16 cement into the wellbore through at least one mud passage of
17 the drill bit;

18
19 allowing the cement to cure;

20
21 thereby cementing into place the drill string to make a
22 cased wellbore.

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25 2. Rotary drilling apparatus to drill a borehole into the
26 earth comprising a hollow drill string, possessing at least
27 one geophysical parameter sensing member, attached to a
28 rotary drill bit having at least one mud passage for passing
29 the drilling mud from within the hollow drill string to the
30 borehole, a source of drilling mud, a source of cement, and
31 at least one latching float collar valve means that is pumped
32 with the drilling mud into place above the rotary drill bit
33 to install said latching float collar means within the hollow

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1 drill string above said rotary drill bit that is used to
2 cement the drill string and rotary drill bit into the earth
3 during one pass into the formation of the drill string to
4 make a steel cased well.

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7 3. A method of drilling a well from the surface of the
8 earth and cementing a drill string into place within a
9 wellbore to make a cased well during one pass into formation
10 using an apparatus comprising at least a hollow drill string,
11 possessing at least one geophysical parameter sensing member,
12 attached to a rotary drill bit, said bit having at least one
13 mud passage to convey drilling mud from the interior of the
14 drill string to the wellbore, a source of drilling mud, a
15 source of cement, and at least one latching float collar
16 valve assembly means, using at least the following steps:

17
18 pumping said latching float collar valve means from the
19 surface of the earth through the hollow drill string with
20 drilling mud so as to seat said latching float collar valve
21 means above said drill bit; and

22
23 pumping cement through said seated latching float collar
24 valve means to cement the drill string and rotary drill bit
25 into place within the wellbore, whereby said geophysical
26 parameter sensing member is used to measure at least one
27 geophysical parameter from within said drill string.

28
29 4. An apparatus for drilling a wellbore comprising: a drill
30 string having a casing portion for lining the wellbore; and
31 a drilling assembly operatively connected to the drill string
32 and having an earth removal member and a geophysical
33 parameter sensing member.

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1 5. The apparatus of Claim 4, further comprising a latching
2 float collar valve means which, after the removal of said
3 geophysical parameter sensing member from said wellbore, is
4 pumped from the surface of the earth through said drill
5 string with drilling mud so as to seat said latching float
6 collar valve means above said earth removal member.